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LUMBER PRODUCTION RATE FROM VARIOUS-SIZED LOGS AT MISSOURI OZARK SAWMILLS

Much of the lumber now being produced in the Missouri Ozarks is from logs less than 11 inches d.i.b. (diameter inside bark at the small end) and less than 12 feet long. Many sawmills are sawing lumber from hardwood logs as small as 6 inches d.i.b. and from pine logs as small as 4 inches d.i.b. Sawing time affects the cost of lumber production, which in turn affects the margin for profit and the prices that can be paid for stumpage and logs. The need for data bearing on the marketing of woodland products in the Missouri Ozarks prompted the Central States Forest Experiment Station to determine the sawing time for logs of various sizes in the small sawmills typical of this locality. The results obtained in this study may lead sawmill operators and others to question the desirability of sawing a high proportion of small logs.

The study was made at four circular sawmills in the Missouri Ozarks. They were typical of those mills sawing 5,000 to 8,000 board feet of lumber per day. The mills were set up semipermanently, were powered by motors of 60 to 80 horsepower, were using saws of 48 to 52 inches in diameter, and were equipped with edgers. A crew of four to six men operated each of the mills on a year-round basis. Three of these mills were sawing hardwood logs, mostly oak ranging from 7 to 23 inches d.i.b. The other was sawing shortleaf pine logs ranging from 4 to 13 inches d.i.b. Log lengths at all mills varied from 8 to 16 feet. All of the mills were sawing inch lumber of maximum widths; however, small quantities of dimension material were cut from the center of logs of all sizes. Most of the production was low-grade lumber suitable for boxboards, crating, and local construction.

Records were kept of sawing time and board-foot production for approximately 100 sound logs at each mill. Sawing time began when a log was rolled onto the carriage and ended when the carriage was ready for the next log. Time devoted to saw-sharpening, breakdowns, and other interruptions was not included in this study. Sawing time varied slightly at the different mills depending upon plant layout, number and efficiency of workers, and other factors. These differences were not great. Accordingly, all of the data were combined by log-size classes to increase reliability and to reduce variation where the size of the sample was small. The results, grouped by log-diameter classes, are shown in table 1.

In this study the average sawing time was fairly constant at about 1 hour per thousand board feet for logs 15 inches d.i.b. and larger. For logs ranging from 9 to 15 inches d.i.b., sawing time increased moderately,

Table 1.--Lumber production per hour and sawing time per thousand board feet for logs of different diameters at four Ozark sawmills

Log diameter class (Inches)	Logs in sample	Volume in sample	Average length of log	Average lumber production per hour	Average sawing time per thousand board feet 1/
	Number	Board feet 1/	Feet	Board feet 1/	Hours
4	13	73	8.5	280	3.5
5 & 6	50	485	9.3	415	2.4
7 & 8	23	509	9.9	600	1.7
9 & 10	110	4,044	9.6	750	1.3
11 & 12	102	5,706	9.9	855	1.2
13 & 14	58	4,657	9.9	920	1.1
15 & 16	25	2,964	10.6	980	1.0
17 & 18	11	1,723	10.4	1,030	1.0
19 to 23	12	2,323	10.2	1,100	0.9
All logs	404	22,484	9.8	858	1.2

1/ Mill tally.

about 20 percent. However, the sawing time per thousand board feet for logs ranging from 4 to 9 inches d.i.b. increased sharply. For 6-inch logs it was 140 percent more than the sawing time for 15-inch and larger logs. Figure 1 shows this accelerated increase in sawing time for the small logs and the slower more uniform increase in sawing time for large- to medium-diameter logs. Logs 10 inches and smaller in diameter accounted for half the number of logs, but produced only 23 percent of the lumber volume.

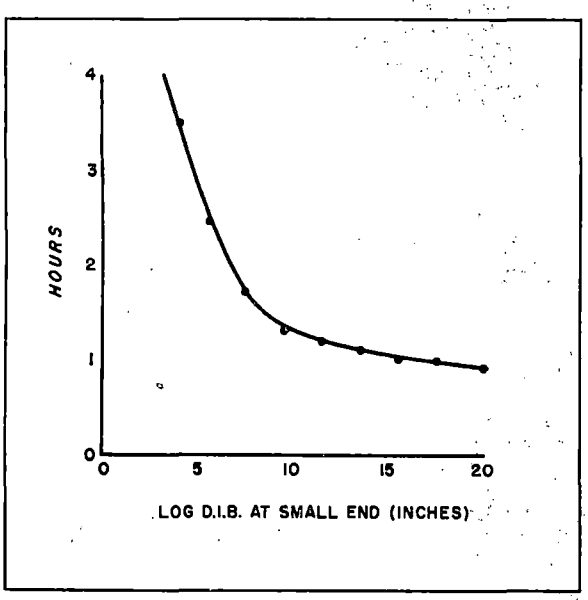

Figure 1.--Average number of hours required to saw 1,000 board feet of lumber from logs of varying diameter at four Ozark sawmills.

Not only does the lumber production per hour increase for the larger logs, but also the lumber grade and value increase sharply. Therefore mill operators who saw mostly large logs will benefit by a higher production rate, and if they sell lumber on a grade basis can benefit from higher selling prices and a greater operating margin. This margin can be used to increase stumpage and log prices, to reduce the price of lumber in a competitive market, or to increase the operator's profit. In any event the market for woodland products is improved. Furthermore, if young rapid-growing trees are left in the woods their increment will provide future timber supplies for local industries.

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